

# Protecting the Colorado River for Utah

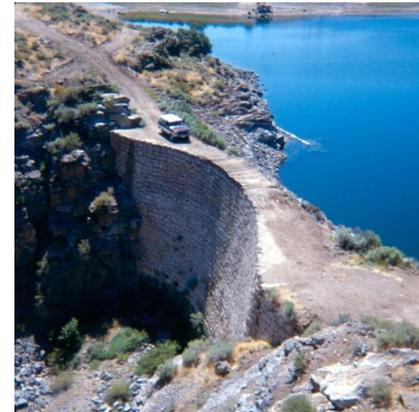
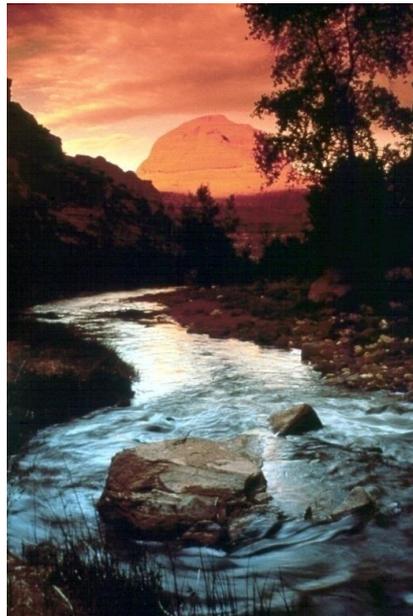
## *2018 Water Users Workshop*

*Eric Millis, Director  
Utah Division of Water Resources*



# Utah Division of Water Resources' Mission

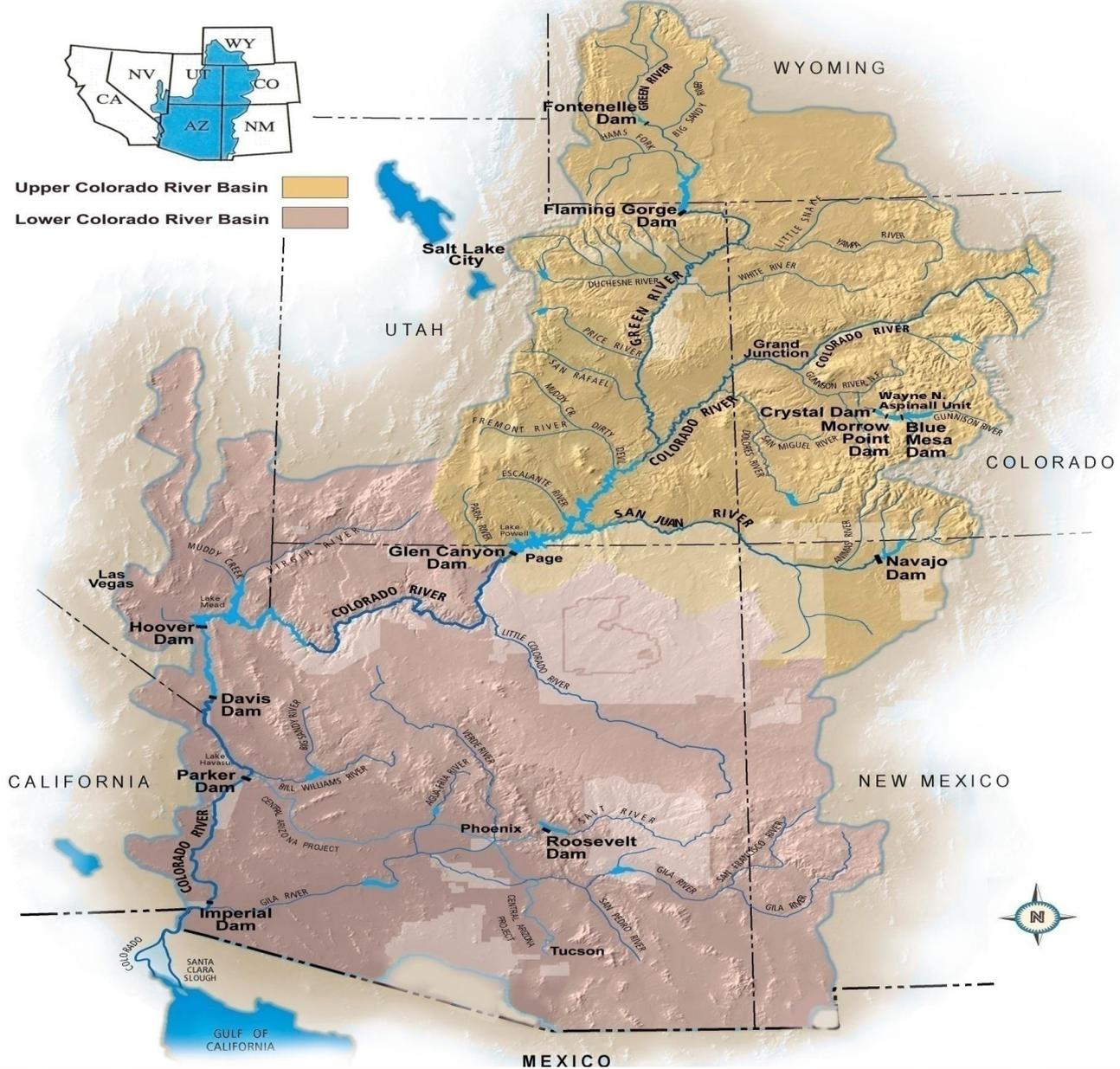
- Plan, Conserve, Develop and Protect Utah's Water



# Colorado River Basin

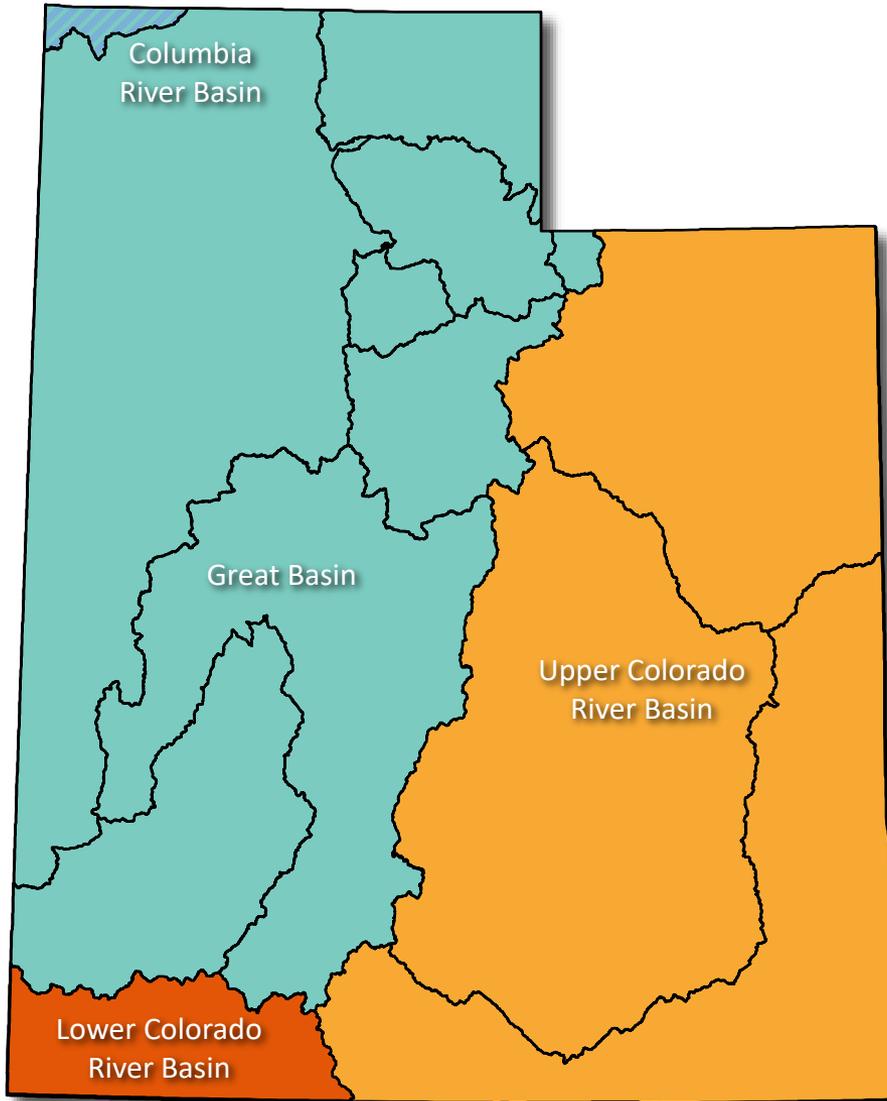


Upper Colorado River Basin   
Lower Colorado River Basin 



# Principal River Basins in Utah

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-  Upper Colorado River Basin
-  Lower Colorado River Basin
-  Great Basin
-  Columbia River Basin

# THE LAW OF THE RIVER

- Colorado River Compact – Foundation
- Upper Colorado River Compact
- 15 other major laws, compacts, treaties and court decrees
- Governs all aspects of administering the River
- Relations with Mexico
- Water quality and environmental issues

# Law of the River Allocations

- 7.5 MAF to Upper Basin (%’s CO 51.75, UT 23, NM 11.25, WY 14)<sup>1</sup>
  - 7.5 MAF to Lower Basin (4.4 CA; 2.8 AZ; 0.3 NV)<sup>2</sup>
  - 1.0 MAF additional to Lower Basin<sup>3</sup>  
(i.e., tributary development)
  - 1.5 MAF to Mexico<sup>4</sup>
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**17.5 MAF** Total Allocated ‘on paper’

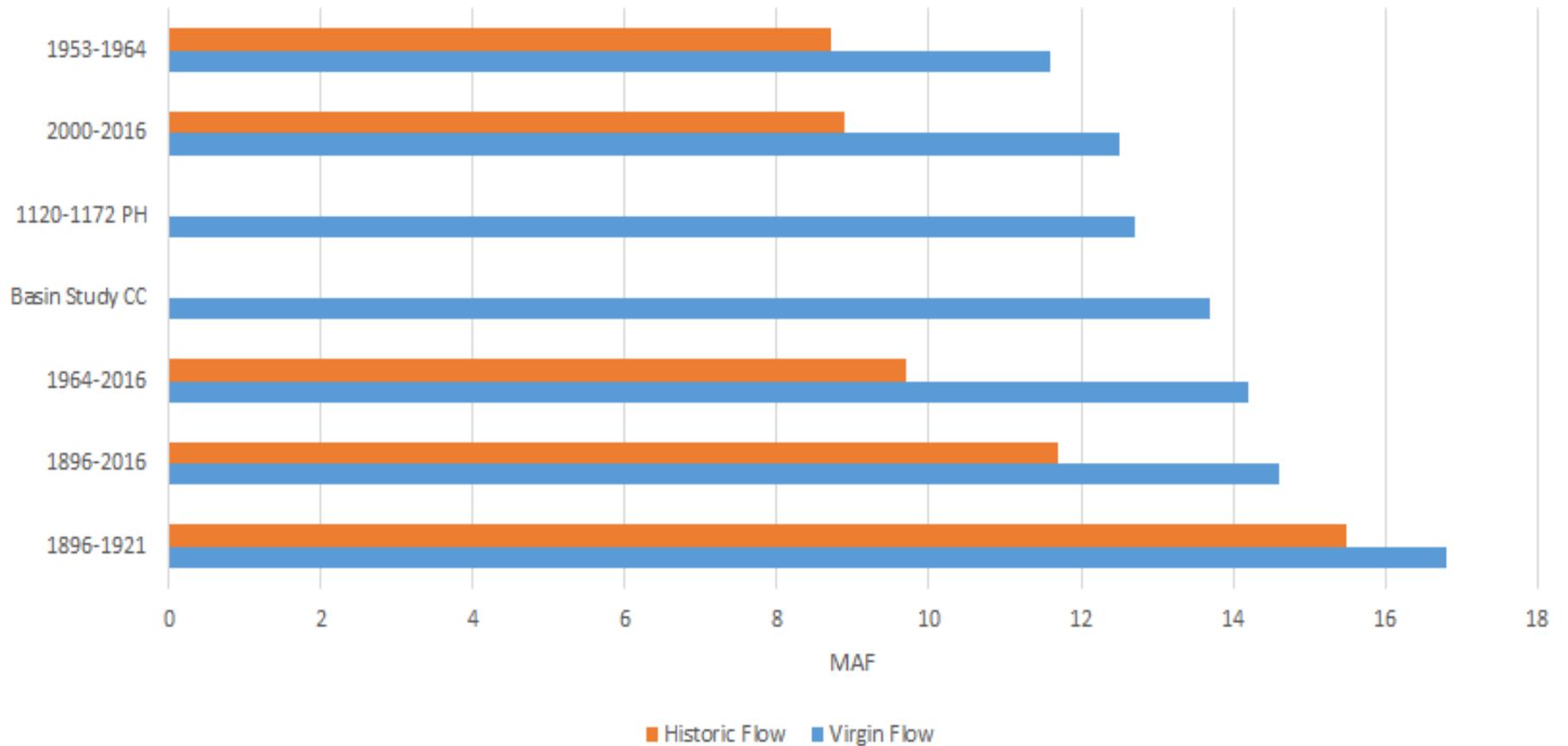
<sup>1</sup> 1922 Colorado River Compact, 1948 Upper Colorado River Compact

<sup>2</sup> Colorado River Compact, 1929 Black Canyon Project Act, 1964 AZ v. CA

<sup>3</sup> 1922 Colorado River Compact

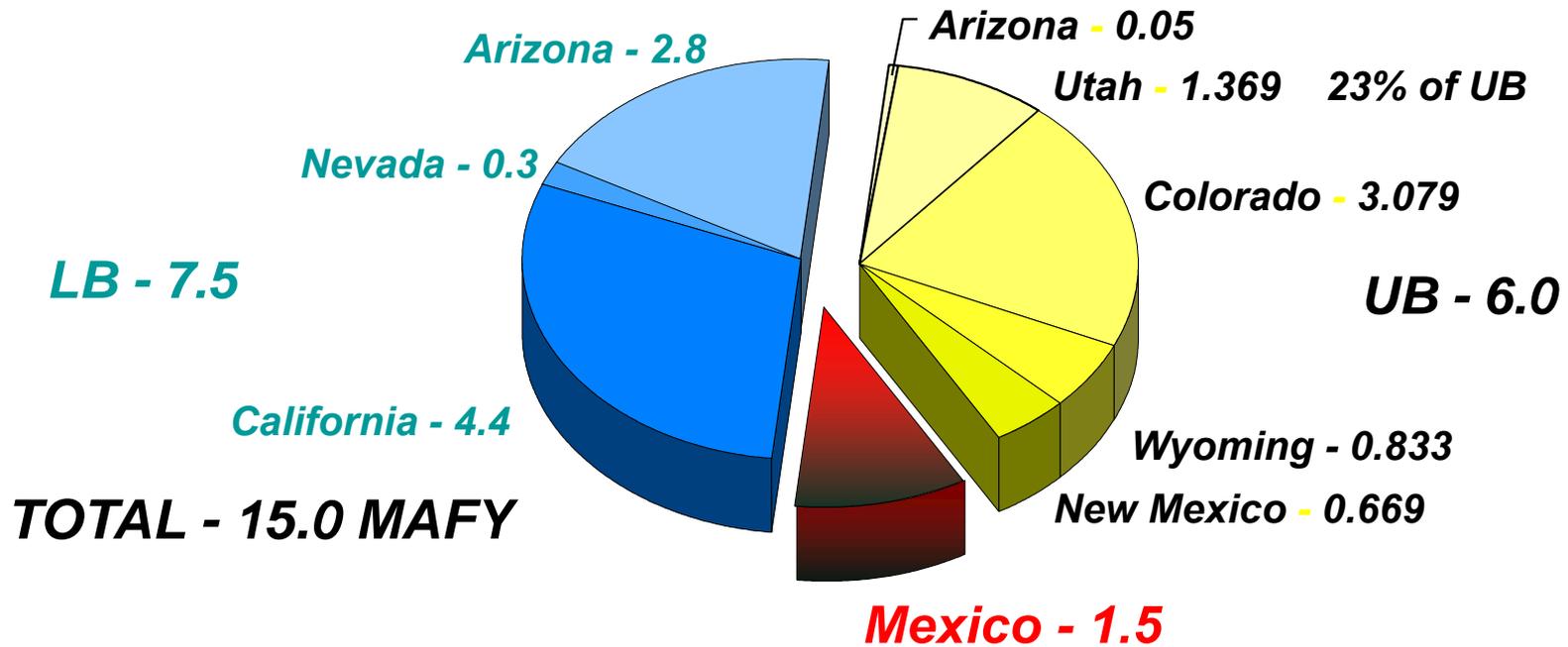
<sup>4</sup> Treaty of 1944

### Lee Ferry Average Annual Virgin Flow



# Compact and Treaty Apportionment Based on Current Hydrology

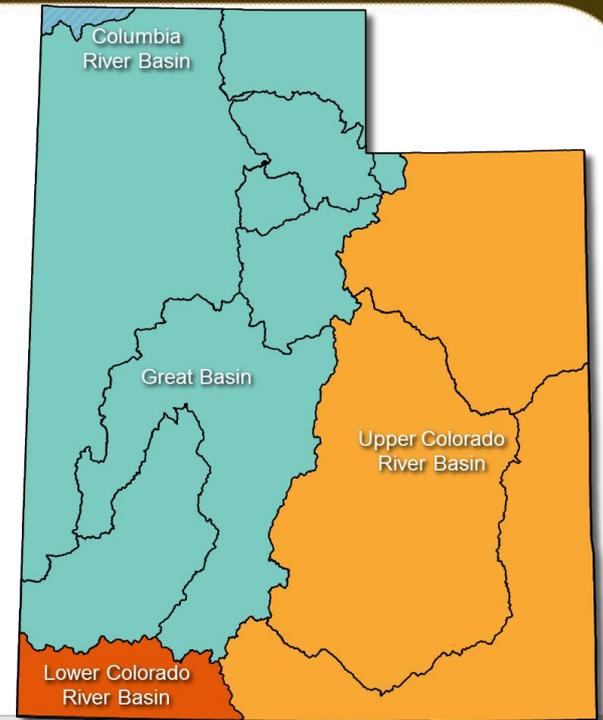
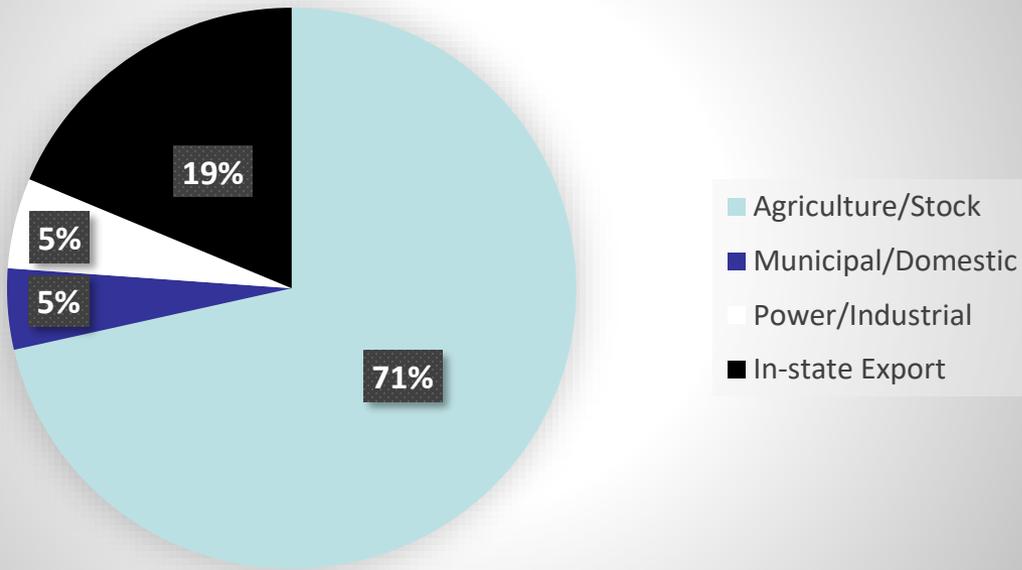
(in million acre feet per year (MAFY))



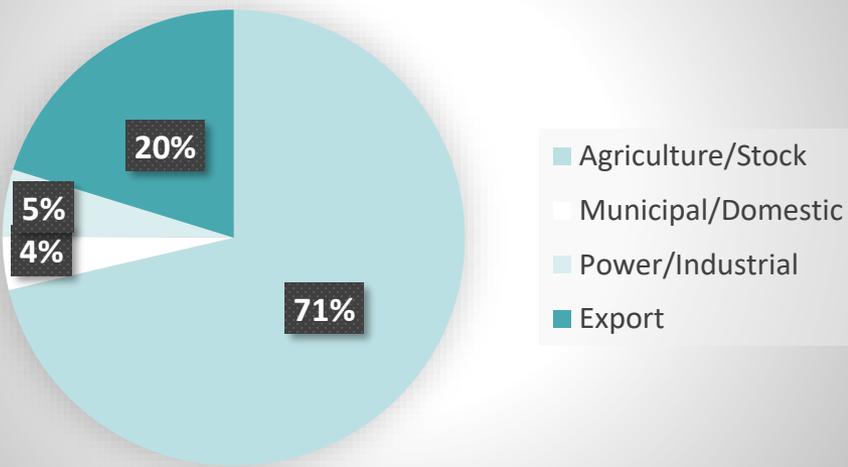
# Current Uses

- Upper Basin Uses
  - 4 to 4.5 maf/yr
  
- Lower Basin Uses
  - Full amount

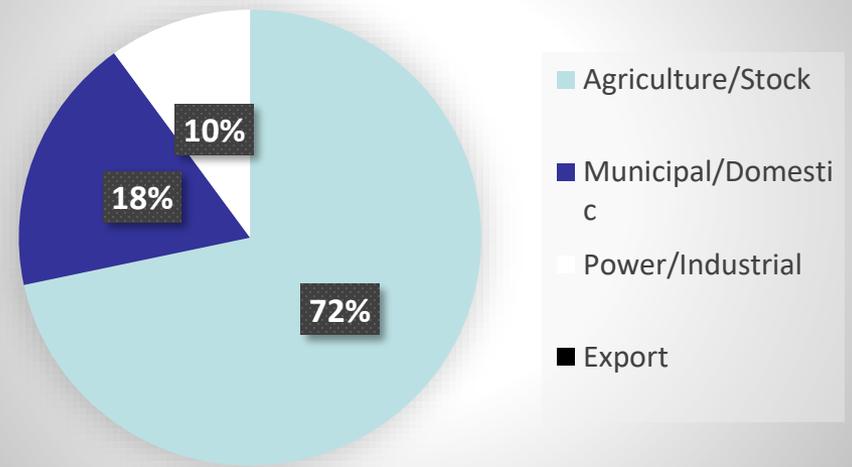
# Utah's Use of the Colorado River



# Upper Colorado River Use



# Lower Colorado River Use



## UTAH'S COLORADO RIVER ALLOCATION

1.369 MAF

Current Use

1.008 MAF

UNUSED ALLOCATION

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.361 MAF

Future Use

Navajo Nation

81 KAF

Ute Tribe Reserve Water (compact)

105 KAF

New Ag Uses

40 KAF

New M&I Uses

29 KAF

Lake Powell Pipeline

86 KAF

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Total

341 KAF

Balance

20 KAF





# Utah's Use of its Remaining Colorado River Allocation



Additional Water Needs  
Energy  
M&I  
Agriculture

Colorado

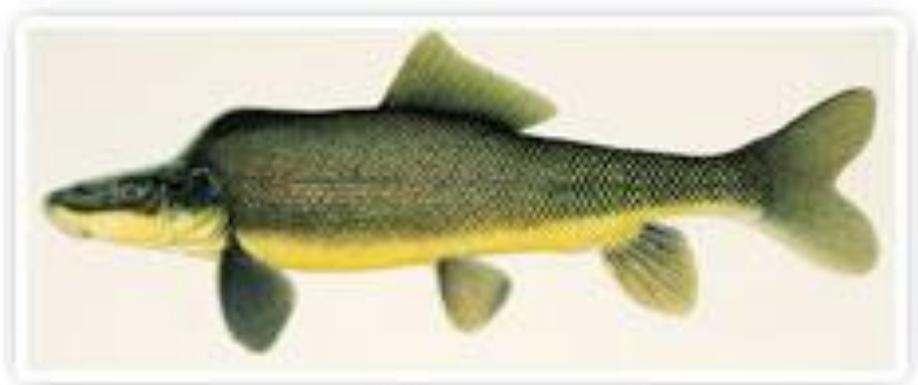
Lake Powell Pipeline



# Endangered Fish Recovery Programs



Humpback chub



Razorback sucker



Bonytail



Colorado pikeminnow



# Nonnative Fish Invasion

River	Presence of Invasive Species	
	1988	Today
Colorado		
Gunnison		
Green		
White		
Yampa		

# Colorado River Salinity Control Program



# Colorado River Basin Salinity 2015

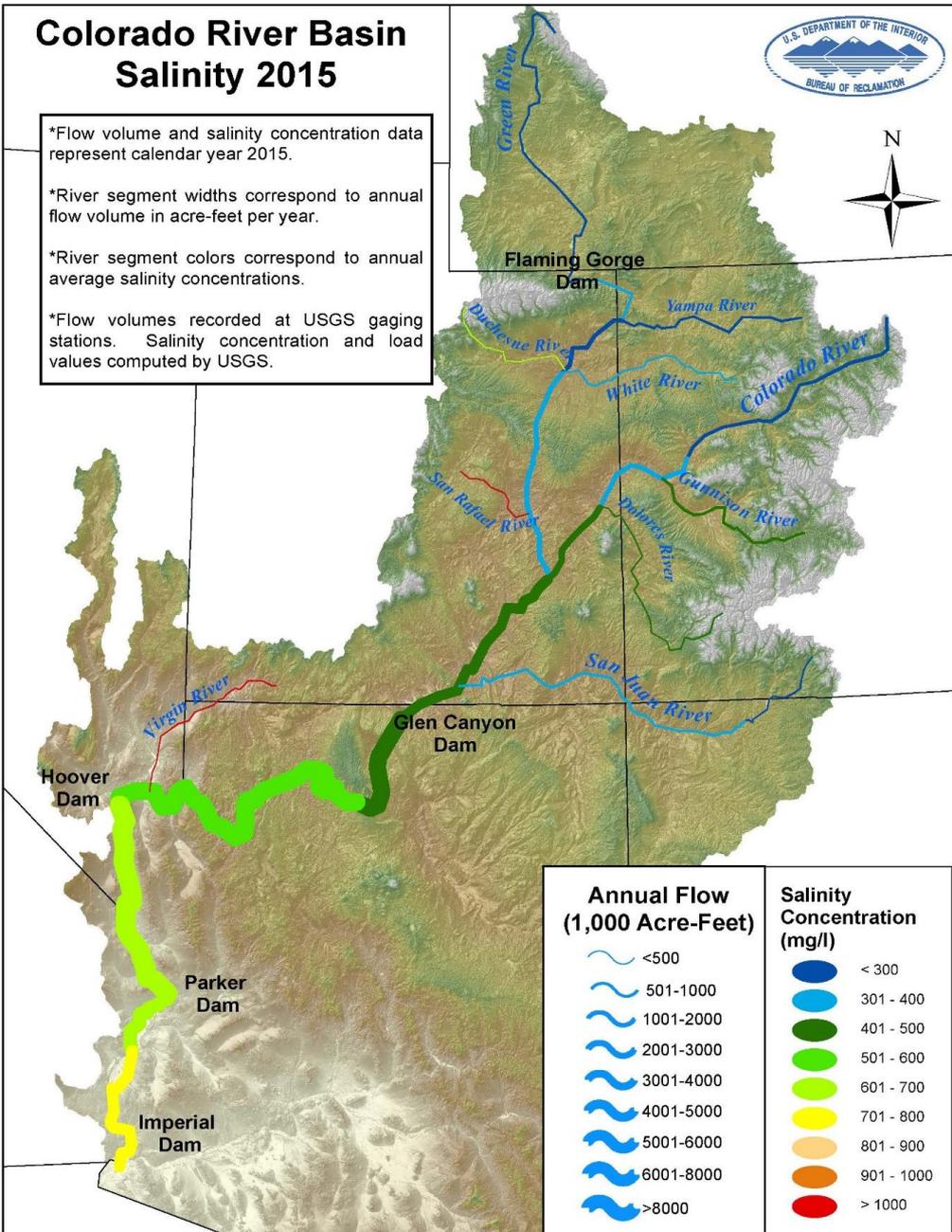


\*Flow volume and salinity concentration data represent calendar year 2015.

\*River segment widths correspond to annual flow volume in acre-feet per year.

\*River segment colors correspond to annual average salinity concentrations.

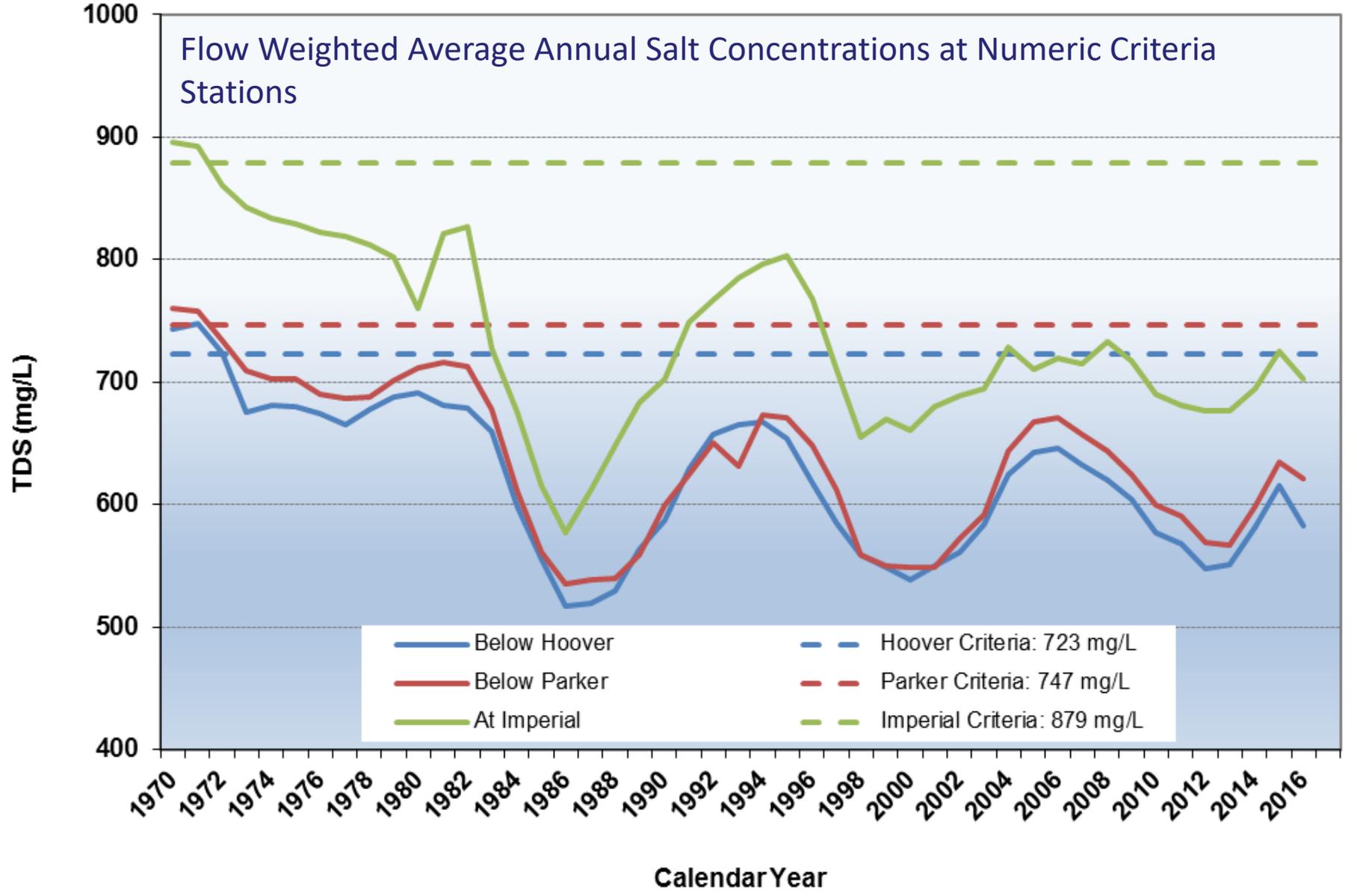
\*Flow volumes recorded at USGS gaging stations. Salinity concentration and load values computed by USGS.



Annual Flow (1,000 Acre-Feet)	Salinity Concentration (mg/l)
<500	< 300
501-1000	301 - 400
1001-2000	401 - 500
2001-3000	501 - 600
3001-4000	601 - 700
4001-5000	701 - 800
5001-6000	801 - 900
6001-8000	901 - 1000
>8000	> 1000

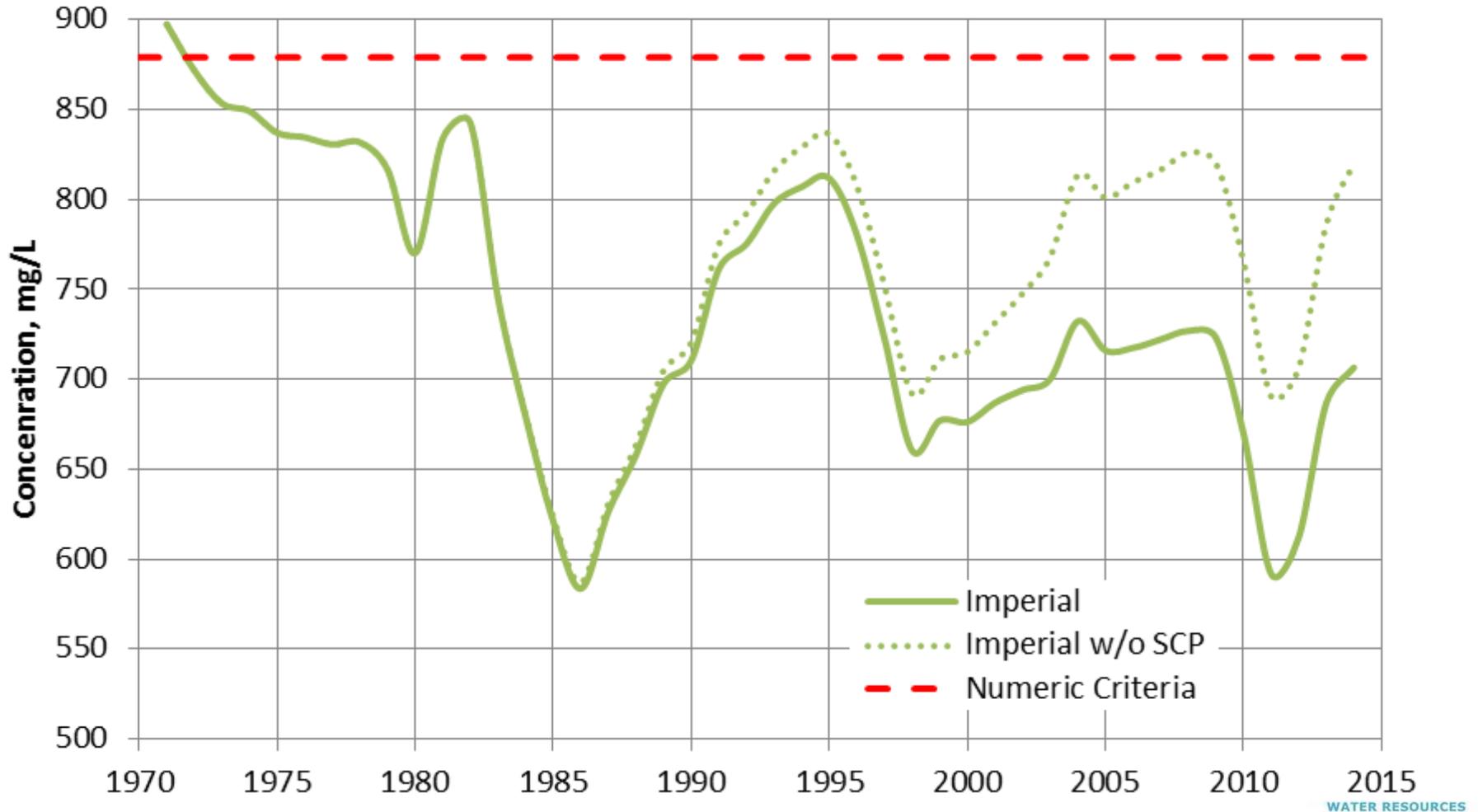


# Flow Weighted Average Annual Salt Concentrations at Numeric Criteria Stations



# Colorado River at Imperial Dam

## Average Annual Concentration Historical & Without SCP, 1971-2014





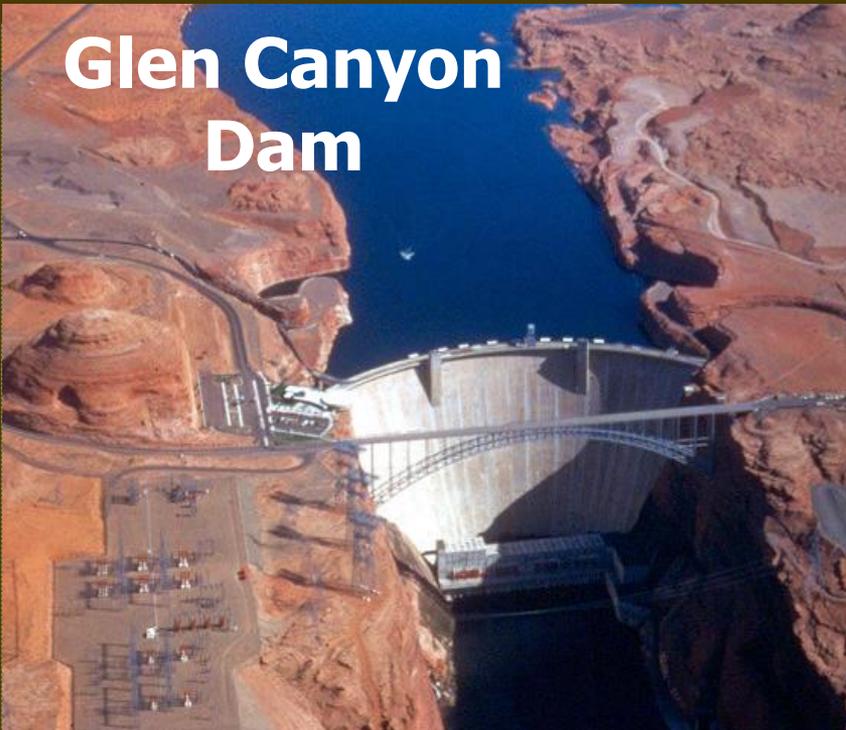
So, how do the states get along?

# *Upper Basin Plan*

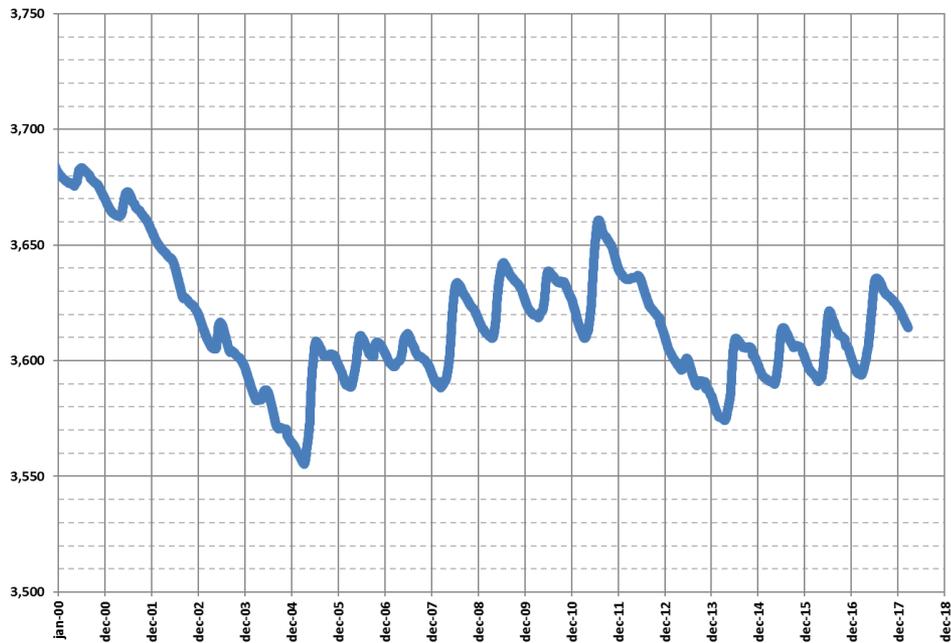
- Expand existing weather modification programs
  - Expand Upper Basin cloud seeding programs to increase Colorado River system water supplies
- Drought operations (Blue Mesa, Flaming Gorge, Navajo and Glen Canyon Dam)
  - Maintain a safe elevation at Lake Powell by conserving water (temporarily) in Lake Powell or moving water available from upper CRSP facilities within current RODs and Biological Opinions
- Develop opportunities for Upper Basin demand management
  - Facilitate voluntary reductions in consumptive use through willing seller/willing buyer arrangements such as temporary or rotational fallowing, interruptible supply agreements, deficit irrigation of crop land, system efficiencies, etc.



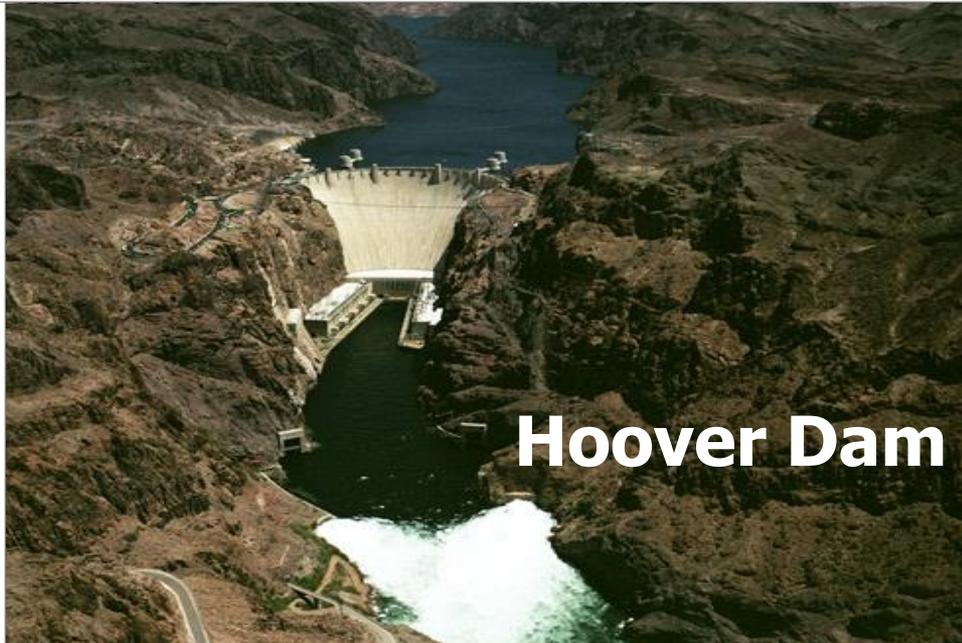
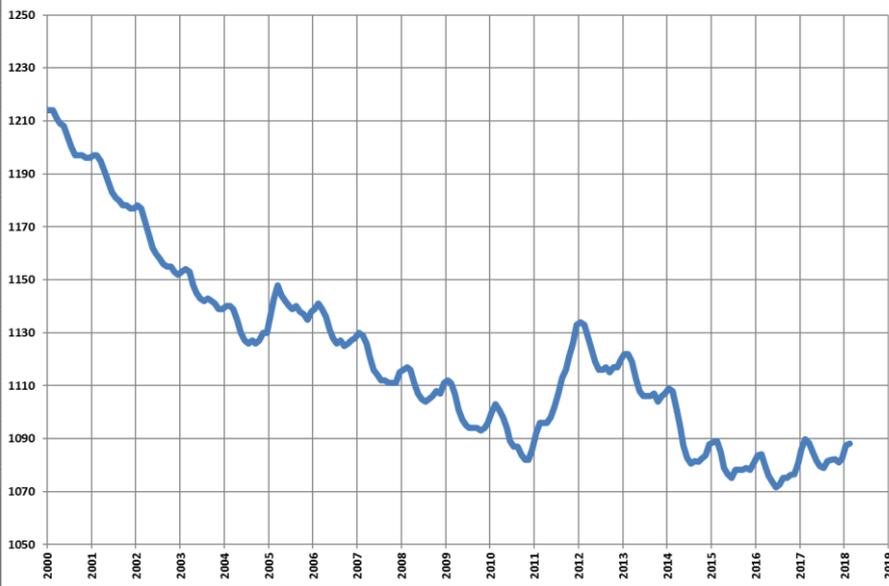
# Glen Canyon Dam



### Lake Powell Elevations (feet)



### Lake Mead Elevations (feet)



# Hoover Dam

# Water Budget at Lake Mead

- Inflow = 9.0 maf  
(release from Powell + side inflows)
- Outflow = - 9.6 maf  
(AZ, CA, NV, and Mexico delivery  
+ downstream regulation and gains/losses)
- Mead evaporation losses = - 0.6 maf
- Balance = - 1.2 maf

Given basic apportionments in the Lower Basin, the allotment to Mexico, and an 8.23 maf release from Lake Powell, Lake Mead storage declines about 12 feet each year

RECLAMATION

# Impacts of the Structural Deficit

Results in a decline of 12+ feet in Lake Mead every year when releases from Powell are “normal” (8.23 MAF)

Results in a decline of 4 feet in Lake Mead every year when releases from Powell are “balancing” (9.0 MAF)

Drives Lower Basin to take shortages

May bring Lake Powell down with it if more water is required to be released under the 2007 Guidelines



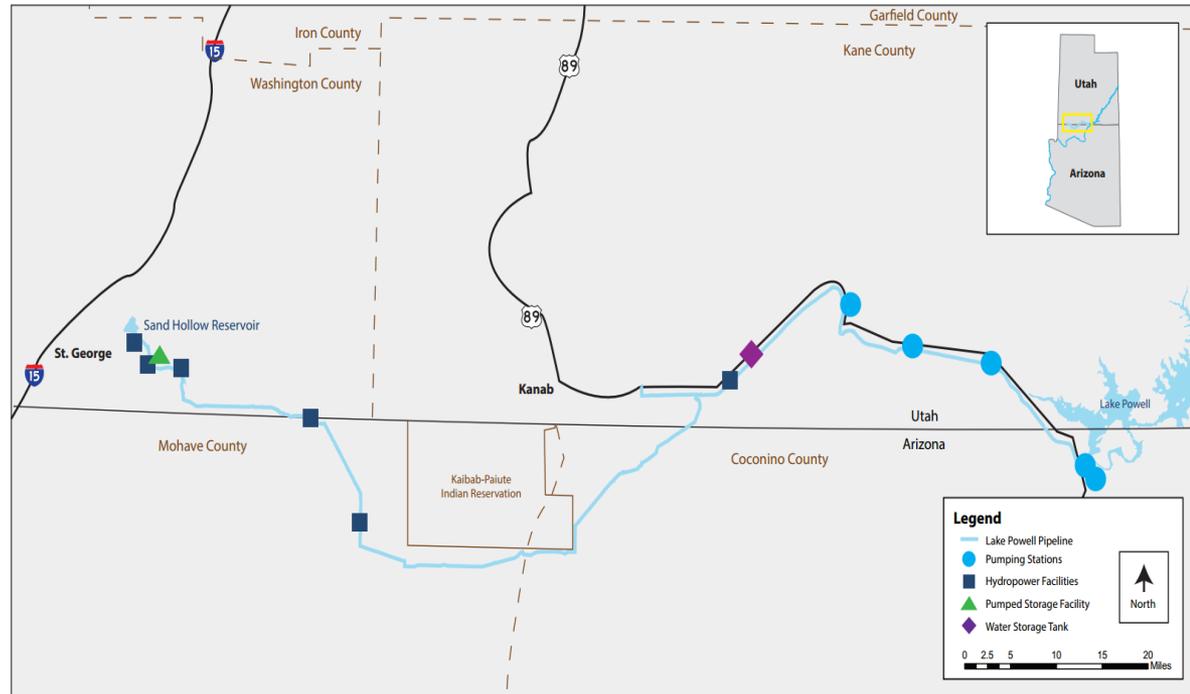
# Interim Guidelines Revisions

- Current guidelines expire in 2026
- Revisions to begin by 2020
- Key points by Upper Basin States
  - **Fix the Structural Deficit**
  - Get rid of 20' provision

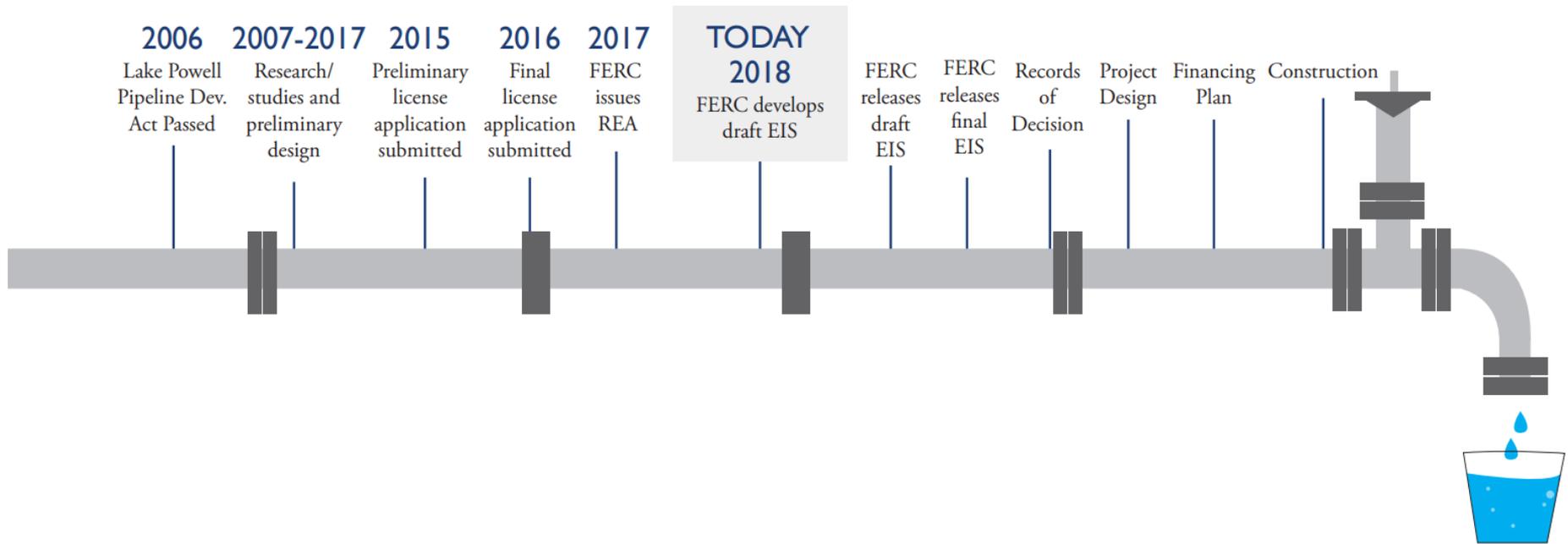


# The Lake Powell Pipeline (LPP)

- State project
- Delivers 86,249 AF of water
- Approximately 140 miles buried pipeline
- 5 pump stations
- 6 hydropower stations



# Anticipated Project Timeline





# The End Thanks!

Eric Millis, Director  
Division of Water Resources

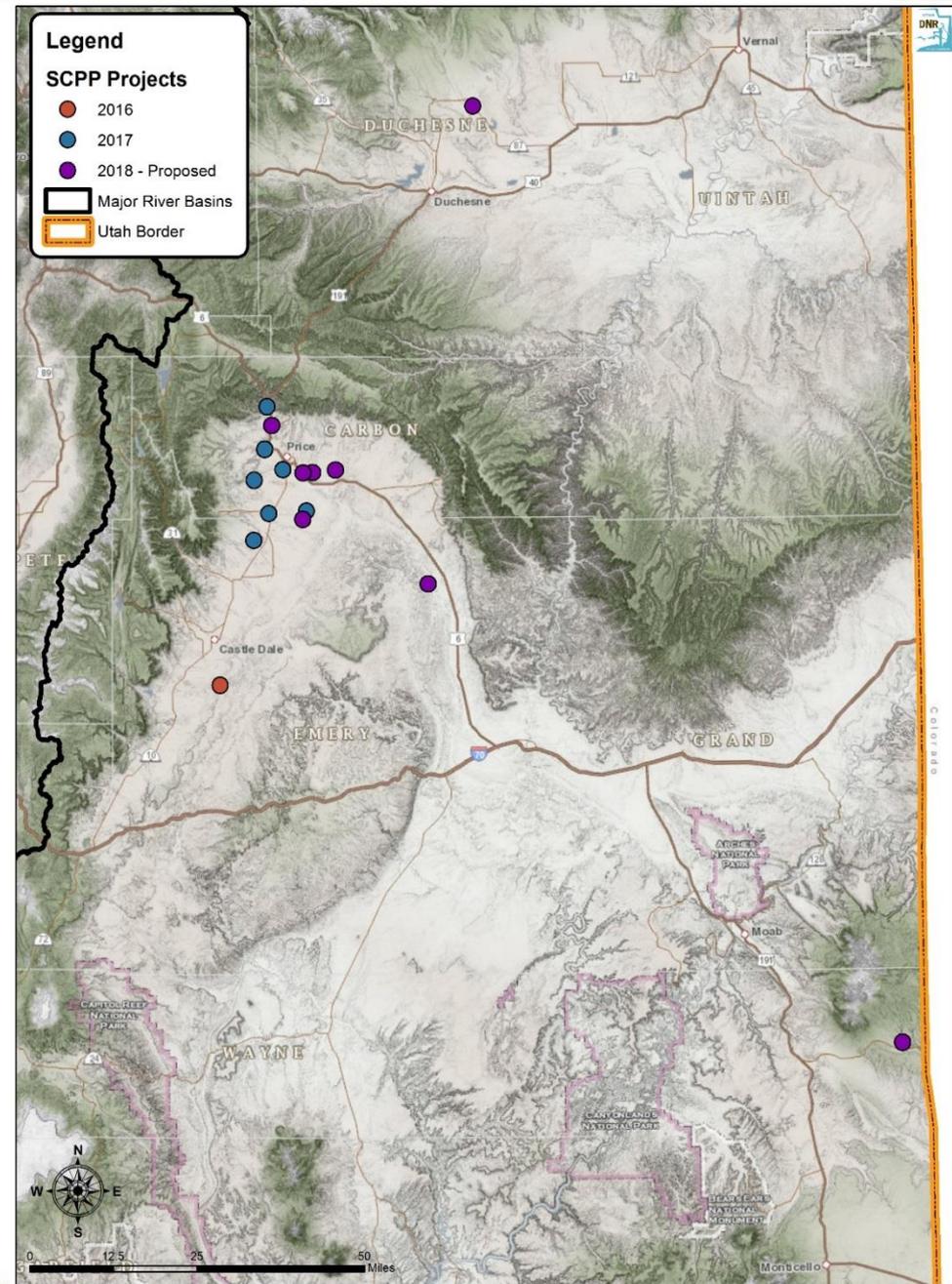
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# Utah SCPP Projects

- Program has expanded in size and coverage
  - 2015 – No projects
  - 2016 – One project
  - 2017 – Six projects
  - 2018 Potential – Seven Projects (Eleven proposals were received)
- Interest in program has increased thanks to NGOs such as Trout Unlimited



# System Conservation Pilot Program (SCPP)

- Purpose is to explore the value and efficacy of system conservation
- Started in 2015 and still running as a pilot program
- Intended to be a part of Upper Basin DCP
- States still determining the future of the program – Many challenges exist:
  - Shepherding (intrastate and interstate water rights)
  - Program scale to be effective
  - Administration of program



# Water Horse Resources LLC

- Propose to divert water from the Green River below Flaming Gorge Dam
- Filed an application with the Utah State Engineer to appropriate 55,000 acre-feet
- Pipeline would extend from Brown's Park to the Front Range and beyond
- Serve various uses including agriculture

